

**EIA FOR 500 KV TRANSMISSION LINE INTERCONNECTION
ARRANGEMENTS FOR POWER EVACUATION FROM SUKI KINAR,
KOHALA AND MAHL HYDROPOWER PROJECTS IN NORTHERN AREAS**

**ENVIRONMENTAL MONITORING AND LABORATORY TESTING FOR LOT-3
“MAIRA SWITCHING STATION TO ISLAMABAD WEST G/S”**

The LOT-3 (Maira Switching Station to Islamabad West G/S) of the proposed Transmission Line (T/L) is starting from Maira, District Rawalpindi and ends at Bahtar Village, District Attock in Punjab province. Below Terms of Reference (ToR) specifically deals in LOT-3.

1. ToR for Drinking Water and Surface Water Sampling and Testing

This ToR provides the objectives and the scope of work for the environmental sampling and testing laboratory that will be hired to undertake drinking water and surface water sampling and testing in the subject Project Area. The main objective of drinking water and surface water sampling and testing is to evaluate the existing quality of drinking water and surface water.

1.1. Scope of Work

The scope of work consists of but not limited to the following activities/requirements:

- a) Internationally accepted code of practices will be used for drinking water and surface water sampling (collection method, precautions/instructions for sampler, sample preservation before delivered to laboratory for analysis etc.).
- b) Integrated composite sampling will be carried out for obtaining drinking water and surface water samples from the following locations:

Location	Sampling Area	Type of Sample	No. of Samples
1	Rawalpindi and Attock Districts	Surface Water	06
		Drinking Water	10
Total samples			16

- c) The Bidder/Contractor will undertake the required testing for the following parameters:

Type of Sample	Parameters
Drinking Water	Color, pH, Turbidity, Total Hardness, Total Dissolved Solid (TDS), Aluminum (Al), Antimony (Sb), Barium (Ba), Boron (B), Cadmium (Cd), Chloride (Cl ⁻), Chromium (Cr), Copper (Cu), Cyanide (CN), Fluoride (F), Lead (Pb), Manganese (Mn), Mercury (Hg), Nickel (Ni), Nitrate (NO ₃ ⁻), Nitrite (NO ₂ ⁻), Selenium (Se), Residual Chlorine, Odor, Taste, Arsenic (As), Zinc (Zn ²⁺), Pesticides, Phenols (Total Phenolic Compounds), Total Coli forms, Fecal Coli forms (E.Coli).
Surface Water	Temperature, pH, COD, BOD ₅ , Total Dissolved Solids (TDS),

	Total Suspended Solids (TSS), Chloride, Fluoride (F-), Oil & grease, Phenols (Total Phenolic Compounds), Cyanide (CN-), Anionic Detergents as MBAS, Sulfate (SO ₄ ⁻²), Sulfide (S), Ammonia NH ₃ , Cadmium (Cd), Chromium (Cr) as Hexavalent & Trivalent, Copper (Cu), Lead (Pb), Nickel (Ni), Zinc (Zn), Iron (Fe), Manganese (Mn), Selenium (Se), Silver (Ag), Arsenic (As), Barium (Ba), Boron (B), Mercury (Hg), Chlorine (Cl), Total Toxic Metals, Turbidity, Dissolved Oxygen, Pesticides.
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- d) Sampling methodology shall be as per Punjab Environmental Quality Standards (PEQS). NESPAK's engineers/scientist shall supervise the sampling process at site.
- e) Analytical procedures shall be according to USEPA methods. Results of analysis will be compared with PEQS limits. However, where these standards do not provide limits for certain parameters, other appropriate international standards will be used for comparison.
- f) The Contractor will provide comprehensive report on drinking water and surface water which will include, but not limited to the following:
- I. General;
 - II. Sampling methodology and locations;
 - III. Analysis of results with remarks / comments; and
 - IV. CV's and designations of personnel responsible for sampling, monitoring and report writing.
- g) The security arrangements for sampling shall be bidder/contractor's responsibility.
- h) The report must be submitted within fifteen (15) days after mobilization.

2. Program for Ambient Air Quality and Background Noise Levels Monitoring

2.1. Introduction

Ambient air quality and background noise levels monitoring is required to be performed in the same Project Area. The objective of monitoring would be to analyze the existing ambient air quality and background noise levels at each site and to analyze the existing emission sources.

2.2. Monitoring Locations

Total twenty (20) locations have been identified for baseline ambient air quality (10 Points) and background noise level monitoring (11 Points), which are given below:

Sr. No.	Location	Type of Monitoring	No. of Samples
1	Rawalpindi and Attock Districts	Ambient Air	10
		Background Noise Level	10
Total sampling points			20

The exact locations will be finalized by NESPAK's Environment Specialist, who will also supervise the field activities of the laboratory.

2.3. Methodology for Ambient Air Quality and Background Noise Level Monitoring

The monitoring methodology for each of the air quality parameter will be in accordance with the requirements of PEQS, Statutory Regulatory Order (SRO) 1062 (I)/2010 for ambient air and 1064(I)/2010 for Noise levels. Sampling methodology will be approved by NESPAK before mobilization to site and monitoring works will be top supervised by NESPAK's representative (s).

2.4. Monitoring Protocol

The details of the testing parameters and averaging period as per PEQS are given below:

Type of Sample	Number of Samples	Testing Parameters
Ambient Air Monitoring	10	SO ₂ (Averaging Period: 24 hours)
		NO (Averaging Period: 24 hours)
		NO ₂ (Averaging Period: 24 hours)
		CO (Averaging Period: 1 hour & 8 hours)
		Suspended Particulate Matter (Averaging Period: 24 hours)
		PM ₁₀ (Averaging Period: 24 hours)
		PM _{2.5} (Averaging Period: 1 hour & 24 hours)
		Ozone (Averaging Period: 1 hour)
Noise Level Monitoring	10	dB(A)

2.5. Monitoring Report

After completion of monitoring and testing, results will be compared with PEQS and a comprehensive report on baseline air quality and noise levels monitoring will be prepared and submitted by the monitoring laboratory within fifteen (15) days after mobilization. Report will cover the introductory part, sampling methodology, monitoring and sampling locations with coordinates, analysis of results/remarks, comparison with applicable national and international standards and pictorial representation.

2.6. Transportation and Security

The cost for collection, preservation and transportation of samples to the laboratory and other logistics such as transport, accommodation etc. is to be borne by the Laboratory. The Contractor shall arrange transport for Engineer's supervisory staff for site duties (from hotel to working site and back hotel). Cost must be inclusive of all taxes. Considering the topography of the area, the cost of hiring local jeeps for the movement of equipment's (if required) shall be borne by the bidder. The bidders shall also take care of security arrangements (if required) for themselves during field work.